

ABSTRACT

Motor stall can be detected without the use of additional sensors in a hybrid stepper motor through the detection of a harmonic component an associated motor spectrum. The associate motor spectrum can be a motor command voltage spectrum. For example, all of the harmonic components except for the second harmonic are eliminated from the voltage and the presence or lack thereof indicates whether or not the motor has stalled. The harmonic component can be isolated with the use of several cascaded filters. These filters can include notch filters and bandpass filters. Additionally, the circuit may be realized as either an analog, digital or hybrid circuit. The motor may be either hybrid stepper motor having 2, 3, or 5 phases, or a variable reluctance motor.